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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,530	08/07/2001	Lawrence D. Bergman	YOR920000742US1	2121

7590 03/24/2004  
Ryan, Mason & Lewis, LLP  
90 Forest Avenue  
Locust Valley, NY 11560

EXAMINER

TO, BAOQUOC N

ART UNIT	PAPER NUMBER
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2172

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DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary**

Application No.

09/923,530

Applicant(s)

BERGMAN ET AL.

Examiner

Baoquoc N To

Art Unit

2172

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2172

### **DETAILED ACTION**

1. Claims 1-49 are presented for examination.

#### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1, 25 and 49 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya et al. (US. Patent No. 01/20/2004).

Regarding on claims 1, 25 and 49, Acharya teaches a computer-based method of retrieving one or more items from at least one database in response to a query specified by a user via at least one example set, the method comprising the steps of:

Constructing a scoring function from the at least one example set, wherein the scoring function is operable for use with a multidimensional indexing structure associated with the at least one database (col. 7, lines 11-15); and

Retrieving (selecting), via the multidimensional indexing structure, the one or more database items (images) that have the highest score as computed using the scoring function (col. 6, lines 36-40).

Acharya does not explicitly teach scoring function is operable for use with a multidimensional indexing structure associated with the at least one database. However, Acharya teaches “for very large database, computing distance from the query image 30q to all other image 30 in the database 40 may take substantial time. Thus, ranking and, in turn, retrieval, may be undesirably slow. To obviate the problem, multi-dimensional search techniques may be employed to retrieve a subset of image lying in the neighborhood of the query image 30q in the feature space” (col. 7, lines 46-52). In addition, Acharya discloses in the abstract “a variance-covariance matrix is calculated for all images in the database” (abstract lines 4-5). The suggestion of calculation of the images in the database and the multidimensional search method that allow the examiner come to the conclusion of the claimed limitation as indicates above. Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention was made to include the calculation of images which uses to index the images in the multidimensional in order to allow the efficient search or retrieval method.

Regarding on claims 2 and 26, Acharya teaches the scoring function is constructed from multiple example sets wherein the multiple sets comprise at least one of positive example sets and negative example sets (col. 7, lines 10-15)).

Regarding on claims 3 and 27, Archarya teaches the scoring function (compute the Mahalanobis distance between image 30q) is constructed by combining respective scoring function of the multiple example sets (col. 7, lines 10-15).

Regarding on claims 4 and 28, Acharya teaches combining the scoring functions of the positive example sets and the negative sets comprises the steps of:

Modifying the scoring functions of the positive example sets and the negative example sets so that the scoring functions of the positive example sets assign low scores to representative examples of the negative example sets, and so that the scoring functions of the negative example sets again low scores to representative samples of the positive example sets (col. 6, lines 50-67); and

Combining the modified scoring functions of the positive example sets and the negative example sets (col. 6, lines 50-67).

Regarding on claims 5 and 29, Archarya teaches the scoring function assign a score to an element of a search space associated with the at least one database equal to the minimum of: (1) the maximum of the scores assigned to the element by the scoring functions of the positive example sets (col. 6, lines 50-67); and (ii) the minimum of one minus the scores assigned to the element by the scoring functions of the negative example sets (col. 6, lines 50-67).

Regarding on claims 6 and 30, Archarya teaches the scoring function give higher scores to database items that are more closely related to the query than to the database items that are not as closely related to the query (col. 7, lines 30-39).

Regarding on claims 7 and 31, Archarya teaches a scoring function is obtained for the at least one example set by:

Computing a characteristic example from the at least one example set (col. 7, lines 10-15);

Computing a dispersion characterization of the at least one example set in association with the characteristic example (col. 7, lines 10-15); and

Using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function (col. 7, lines 10-15).

Regarding on claims 8 and 32, Archarya teaches the characteristic example is a centroid, a median, or a node computed over at least a portion of the example set (col. 7, lines 10-15).

Regarding on claims 9 and 33, Archarya teaches the dispersion characterization associated with the example set comprises a covariance matrix, a standard deviation, central moments, order statistic of differences, or third moments capturing asymmetry (col. 7, lines 10-17).

Regarding on claims 10 and 34, Archarya teaches the step of using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function further comprises computing weight distances between the characteristic example and the one or more samples from the database using the dispersion characterization to compute weights (col. 7, lines 10-15).

Regarding on claims 11 and 35, Archarya teaches weighted distances are Euclidean distances or Minkowsky distances (col. 7, lines 10-15).

Regarding on claims 12 and 36, Archarya teaches a scoring function is computed for the at least one example set by converting one or more semi-metrics obtained using the at least one example set to one or more scores using a conversion function (col. 7, lines 10-15).

Regarding on claims 13 and 37, Archarya teaches the semi-metrics are weighted Minkowsky distances from a representative samples in the at least one example set, and further wherein weights are calculated using the examples in the at least one example set (col. 7, lines 10-15).

Regarding on claims 14 and 38, Archarya teaches weights are the inverse of standard deviations of the examples in the at least one example set (col. 7, lines 10-15).

Regarding on claims 15 and 39, Archarya teaches the representative sample is a centroid of the examples in the at least one example set (col. 7, lines 10-15).

Regarding on claims 16 and 40, Archarya teaches the conversion function is monotonically non-increasing continuous function having a value equal to one at the origin and a value of zero at infinity (col. 7, lines 10-15).

Regarding on claims 17 and 41, Archarya teaches conversion function is a monotonically non-increasing continuous function having a value of one between zero and a first threshold value and a value of zero after a second threshold value (col. 7, lines 10-15).

Regarding on claims 18 and 42, Archarya teaches the user specifies the number of items to retrieve from the database (col. 8, lines 9-26).

Regarding on claims 19 and 43, Archarya teaches the retrieving step further comprises the step of searching the multidimensional indexing structure to retrieve from the database the items having the highest score (col. 7, lines 45-55).

Regarding on claims 20 and 44, Archarya teaches the multidimensional indexing structure is used to execute different queries (col. 7, lines 45-55).

Regarding on claims 21 and 45, Archarya teaches the multidimensional indexing structure is abased on a recursive partition of a search space associated with the database using hyperlanes parallel to coordinate axes or surfaces other than hyperlanes parallel to coordinate axes (col. 7, lines 10-15).

Regarding on claims 22 and 46, Archarya teaches searching the multidimensional indexing structure comprises the steps of:

Using scoring functions of the multiple example sets to search a tree to identify candidate nodes (col. 7, lines 45-55); and

Using the scoring functions of the multiple example sets to score items stored at leaves of the multidimensional indexing structure (col. 7, lines 45-55).

Regarding on claims 23 and 47, Archarya teaches identifying candidate nodes comprises the steps of:

Computing for each scoring function of the positive example set, the maximum possible score of an item stored at the node or at one of the descendants of the node (col. 7, lines 10-15);

Computing the maximum of the maximum scores (col. 7, lines 10-15);



computing for each scoring function of the negative example sets, the minimum possible score of an item stored at the node or at one of the descendant of the node (col. 8, lines 14-25);

computing the minimum of : (i) the maximum of the maximum score; and (ii) the minimum of one minus the minimum scores (col. 8, lines 14-25);

declaring that a node is a candidate if the minimum is not smaller than the minimum of the scores in the current result set (col. 8, lines 14-25); and

declaring that the node is no a candidate otherwise (col. 8, lines 14-25).

Regarding on claims 24 and 48, Archarya teaches the search is performed by using the scoring functions of the negative example sets (col. 7, lines 55-63).

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Baoquoc N. To whose telephone number is (703) 305-1949 or via e-mail BaoquocN.To@uspto.gov. The examiner can normally be reached on Monday-Friday: 8:00 AM – 4:30 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached at (703) 305-9790.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks  
Washington, D.C. 20231.

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The fax numbers for the organization where this application or proceeding is assigned are as follow:

(703) 872-9306 [Official Communication]

Hand-delivered responses should be brought to:

Crystal Park II  
2121 Crystal Drive  
Arlington, VA 22202  
Fourth Floor (Receptionist).

Baoquoc N. To  
March 18, 2004

  
JEAN M. CORRIELUS  
PRIMARY EXAMINER